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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/085,387	02/28/2002	Anthony D. Kurtz	Kulite-71	6637

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EXAMINER

YUAN, DAH WEI D

ART UNIT PAPER NUMBER

1745

DATE MAILED: 10/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/085,387

Applicant(s)

KURTZ, ANTHONY D.

Examiner

Dah-Wei D. Yuan

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4 and 14 is/are rejected.
- 7) ☒ Claim(s) 3,5-13 and 15-20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

SOLID STATE FUEL CELL

Examiner: Yuan S.N. 10/085,387 Art Unit: 1745 September 30, 2003

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

2. Claim 4 is objected to because of the following informalities:

Claim 4 recites the limitation "The fuel cell wherein said pores of said anode and cathode...." in Line 1. It is not clear what the limitation is referred to. For the interest of compact prosecution, claim 1 is examined as reciting "The fuel cell according to claim 1 wherein said anode and cathode....".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1,2,14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawatsu (US 5,885,727) in view of Mallari et al. (US 2003/0044674 A1).

With respect to claim 1, Kawatsu teaches a fuel cell system comprising an electrolyte (11), an anode (12) and a cathode (13) functioning as gas diffusion electrode and arranged across the electrolyte to form a sandwich structure. Separators (14,15) are arranged across the sandwich structure and respectively connecting with the anode and the cathode to define flow paths of fuel and oxidant. The planar electrolyte is composed of a silicon carbide matrix (a semiconductor structure) impregnated with electrolytic solution. See Figure 1; Column 11, Lines 50-67.

However, Kawatsu does not teach the use of semiconductor anode and cathode structures in the fuel cell system. Mallari et al. teach the use of electrode structure comprising a silicon (semiconductor) substrate with one or more discrete porous, bulk matrix regions. Metallic catalyst carried on the silicon electrode structures is also disclosed wherein the catalyst facilitates oxidation–reduction reactions of a fuel or an oxidant. The catalyst may be carried on the surface or face of a silicon substrate. The use of silicon electrode structure, when appropriately doped, can function as a current collector and provide the ability to be selectively sculpted, metallized and processed into complicated structure via semiconductor micro-fabrication techniques. See Paragraphs 15, 28, 38. Therefore, it would have been obvious to one of ordinary skill in the art to use the semiconductor anode and cathode structures on the planar electrolyte structure of Kawatsu, because Mallari et al. teach the use of silicon electrode structure to enhance the performance of the resultant fuel cell system.

With respect to claim 2, Millari et al. teach the electrode structure is surrounded by a non-porous peripheral structure of silicon as shown in Figures 38A, 38 B, 65A and 65B. It would have been obvious to one of ordinary skill in the art to use the semiconductor anode and cathode

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structures with a non-porous peripheral structure on the planar electrolyte structure of Kawatsu, because Mallari et al. teach the use of silicon electrode structure to enhance the performance of the resultant fuel cell system.

With respect to claim 14, Millari et al. teach the porous silicon substrates is formed by a photoelectrochemical HF anodic etching technique wherein the pores would be invariably different in sizes. It would have been obvious to one of ordinary skill in the art to use the semiconductor anode and cathode structures with different pore diameters on the planar electrolyte structure of Kawatsu, because Mallari et al. teach the use of silicon electrode structure to enhance the performance of the resultant fuel cell system.

Allowable Subject Matter

5. Claims 3-13,15-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 3 would be allowable because the prior art does not disclose or suggest the electrolyte structure is fabricated from silicon. Claims 4-13,15-20 would be allowable because the prior art does not disclose or suggest the anode and cathode having an enlarged opening portion at the first surface tapering to a smaller opening at the second surface.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (703) 308-0766. The examiner can normally be reached on Monday-Friday (8:00-5:00).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Dah-Wei D. Yuan
September 30, 2003

A handwritten signature in black ink, appearing to read "Dahwei Yuan", with a long horizontal flourish extending to the right.